CLAIMS

What is claimed is:

1. A turbine engine nozzle subassembly comprising:

an upstream flap;

a downstream flap pivotally coupled to the upstream flap for relative rotation about a hinge axis; and

an actuator linkage coupled to the downstream flap along a forward half thereof for actuating the upstream and downstream flaps between a plurality of throat area conditions.

2. The subassembly of claim 1 further comprising:

an external flap pivotally coupled to the downstream flap and to an environmental structure so that a span between respective coupling locations with said downstream flap and environmental structure is extensible and contractable responsive to aerodynamic forces; and

means for restricting an extensibility range of said external flap.

3. The subassembly of claim 2 wherein:

said means comprises a secondary link having a first pivotal coupling location to the environmental structure and a second pivotal coupling location to the divergent flap, the second pivotal coupling location being intermediate the coupling location of the downstream flap to the external flap and a coupling location of the actuator linkage to the downstream flap; and

the secondary link has a restricted free float range relative to the downstream flap.

4. A turbine engine nozzle comprising:

a static structure;

a plurality of flap subassemblies comprising:

an upstream flap pivotally coupled to the static structure for relative rotation about an axis essentially fixed relative to the static structure; and

a downstream flap pivotally coupled to the upstream flap for relative rotation about a hinge axis; and

means for actuating articulation of the upstream and downstream flaps of the plurality of flap subassemblies within a range of areas of the throat while minimizing mode-induced changes in throat area at a given design point.

5. The nozzle of claim 4 wherein:

the plurality of flap subassemblies are axisymmetrically arranged about an engine centerline;

said articulation is simultaneous for each of the flap subassemblies; and

each of the plurality of flap subassemblies further comprises an external flap pivotally coupled to the downstream flap.

6. A method for retrofitting a turbine engine or reengineering a turbine engine configuration which engine or configuration has or has previously had a first nozzle subassembly having a convergent flap, a divergent flap, an external flap, and an actuation linkage coupled to the convergent flap, the method comprising:

installing or engineering a second subassembly comprising:

a second convergent flap;

a second divergent flap; and

a second actuation linkage, optionally sharing one or more components with the actuation linkage of the first nozzle subassembly, and coupled to the second divergent flap so as to permit an aerodynamically-induced mode change articulation of the second divergent flap to rotate the second divergent flap about a non-fixed instantaneous center of rotation while simultaneously rotating the second divergent flap relative to the second convergent flap about a non-fixed hinge axis.

7. The method of claim 6 wherein:

said second subassembly provides an aerodynamic throat having a throat area that is less sensitive to area changes associated with said mode change articulation than was an area of a throat provided by the first nozzle subassembly.

8. The method of claim 6 wherein:

a circumferential array of such first nozzle subassemblies are replaced with a circumferential array of such second nozzle subassemblies.